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A new correlation for the prediction of upward two phase flow characteristics in pipes

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Almost all hydrocarbons wellbores experience multiphase flow in the form of varied combinations of gas oil and/or water fractions. The prediction of multiphase flow characteristics such as the pressure drop and phase fractions is an important requirement in the prediction of the tubing performance relationship (TPR) in these wellbores. Numerous multiphase flow models/correlations exist for these predictions but present limitations in their applicability for varied flow conditions, fluid properties and well configurations. In order to extend a range of applicability, this paper presents a new correlation derived from approximation of seven (7) flow correlations using regression analysis. A dimensionless two phase pressure gradient, flowrate and phase fraction relationships were established which is expected to present a good prediction of flow characteristics in varied flow conditions especially for bubble and slug flow regimes. The performance of this correlation was validated with field data derived from literature and compared with the existing correlations used for the approximation. The pressure gradient prediction and phase fraction Results from the comparative analysis showed an adequate +/-0.05% - 2% deviation from the experimental data.

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Recent development on experimental wax deposition studies in single and two-phase flow

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Deposition of paraffin wax is one of the major areas of concern in the oil and gas industry. Despite many publications and technological advancement the area is still under study to further avoid losses of revenue generation. Several experimental studies carried out in single phase or two-phase flows were reported to be conducted with horizontal, vertical, incline or twisted pipeline flow loop. This study provides a comprehensive review of different geometry used in the experimental studies of wax precipitation and deposition. The main features of the previous study are summarized, with model formulation, assumptions, governing equations, solution method and limitations highlighted. A clear relationship between different mechanisms for wax precipitation and deposition are identified and the progression of each experimental model is presented to capture major improvements. Finally, the paper offered various strategies on how to anticipate, prevent, and remediate wax problems in oil and gas production. Recommendations were made with view to magnify the problems of wax deposition based on different curvature effect at subsea oil and gas production system.

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